TÍTULO: INFLUENCIA DEL REBASE DEL OLEAJE EN PLAYAS SOBRE LAGUNAS COSTERAS. EL CASO DE LA LAGUNA DE LA MAGAROLA

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ABSTRACT

Coast contains an important environmental value which is subjected to a great pressure, hard to arrange with the intense economic activity that takes place. The sand coasts with low height above sea level are the most sensitive to this stress. It is due to the dynamic nature caused by their interaction with the other systems and the natural values they have.

Llobregat river delta is a coastal length which fits in these characteristics and whose ecosystems formed of salty lagoons have a great interest and singularity. In this dissertation wave overwash that comes about during storm events influence over these systems conditions is analysed, focussing on the specific case of Magarola lagoon characterized by having high salinity in comparison with other nearby lagoons.

In order to evaluate the overwash influence over this lagoon, the coastal dynamics and evolution of the zone are analysed with the purpose of characterize the area and the processes that potentially control beach evolution, and so, lagoon characteristics that may be affected, such as its morphology and its physical and chemical characteristics.

That is why a revision of sea processes related with wave overwash and existing methodologies of evaluation is carried out. These methods allow to estimate a magnitude of order of the phenomenon due to great quantity of hypothesis and simplifications that are done when we apply them. Next, available datum of the area are analysed and the global zone and Magarola lagoon in particular are characterized as well as the coast and its behaviour, with the characterization of wave and tidal sea level systems, both of them of vital importance for the following evaluation of overwash discharge. This is because beach flood occurs when total sea level elevation reaches the height of the berm of the beach.

Throughout the development of this work some interesting outcomes have been obtained such as shore line regression during last decades due to an evident erosive behaviour of the coast length that has been analysed. On the one hand the interior line of the beach in front of the lagoon suffers a simultaneous retreat, and so the beach moves inland maintaining practically constant values of its width. This fact is possible because the system is not rigid and has no structure avoiding this motion.

On the other hand, the lagoon area has kept more or less constant until the moment that the beach has reached the lagoon. But from this moment, the constant advance of the beach has promoted that during the last years the lagoon area has been reduced because of the removal of sand transported by wave overwash occurred during storms. Thus, the lagoon will completely disappear if no action is carried out to slow this phenomenon. Related to this, conductivity measurements of the lagoon water show a change in the salinity condition that might be because increasingly conditions are more favourable for overwash reaching the lagoon.

Following with the overwash influence evaluation over lagoon characteristics, possible relation between variations in conductivity and overwash conditions are analysed and discussed. Meteorological conditions are analysed too. It doesn't exist a direct relation between conductivity variations and variables considered in the analysis: overwash discharge, precipitation and temperature. Only in a few cases, like periods with low discharge in which conductivity behaviour turns out to be little predictable.

High salinity of the lagoon may be influenced by other aspects, besides salty water contribution during overwash events, as salinity increase of the lagoon ambience all around (soil, aquifer) due to its location, increasingly influenced by the sea.